

REMARKS

Examiner Khare is thanked for his careful consideration of the present patent application and for withdrawing the Section 112 and prior art rejections formerly of record. The claim rejections presented in the latest Office Action also should be withdrawn.

By way of background, the invention is directed, in certain embodiments, toward a saccharide-derivatized oligosaccharide mixture. The mixture comprises the extrusion reaction product of a saccharide having an average degree of polymerization ranging from 1 to 4 with a mixture of malto-oligosaccharides. These remarks are not intended to be limiting; the scope of the claimed subject matter is as set forth in the pending claims.

In the Office Action, three references are cited, including Meyers et al., U.S. Patent 5,518,739; Yoshida et al., U.S. Patent 4,840,807, and Fouache et al., U.S. Patent 6,630,586. None of these references anticipate the claims of the present application.

The Meyers et al. reference discloses Fibersol. Fibersol is a conventional indigestible dextrin, well known in the art. The Fouache et al. reference is directed to a branched maltodextrin product sold under the trade name "NUTRIOSE" by Roquette Freres, the assignee of the Fouache et al. application.

The Yoshida et al. application does not appear to be relevant to the present disclosure. Yoshida is directed simply towards a fractionization process for maltodextrins. This process does not create bonds, and, in the product of Yoshida, there will be nothing other than alpha-1,4 and alpha-1,6 bonds in the finished product. This is in contradistinction to the present invention, in which bonds other than alpha-1,4 and alpha-1,6 are created (see data hereinbelow).

With regard to the Meyers and Fouache references, the products disclosed therein are indeed different from the product of the present invention. Attached hereto is the Declaration of Dr. Perminus Mungara, a scientist at Grain Processing Corporation, the assignee of the present application. Dr. Mungara compares the properties of a convention Fibersol and a NUTRIOSE product with two products prepared in accordance with the present application, and demonstrates a surprising difference between these materials.

As is seen, the differences between the products covered by claim 1 of the present application and the Fibersol and NUTRIOSE products are substantial. Table 1 from the Mungara Declaration is reproduced hereinbelow.

TABLE 1

Sample	Taste (10% solution)	4-hour digestibility	Viscosity @30% solid/30°C (cps)	DE	pH	Residual Dextrose (%)	Ash (%) (By TGA)
1	Slight tartness but agreeable taste	33	24	17.8	4.6	4.9	1.2
2	Slight sweetness	42	21	19.4	4.9	5.6	0.9
3	Slight sweetness	38	24	19.6	4.8	6.1	1.0
4	Bland taste	38	25	11.5	4.8	2.5	0.8
Fibersol-2	Bland taste	4	15	13.5	3.2	0.4	0.1
NUTRIOSE	Bland taste	15	25	3.5	3.0	0.2	0.5

CA = citric acid, Dex = dextrose

Several parameters of the products of the present invention differ greatly from those of the prior art:

- **4-Hour Digestibility** – This parameter refers to the digestibility of the product after 4 hours in accordance with a test standard, as specified in the Declaration. As seen, the 4-hour digestibility of the products of the present invention are substantially higher than those of either of Fibersol or NUTRIOSE products.
- **Viscosity** – The viscosity of the product for the present invention is substantially greater than that of the Fibersol product.
- **Dextrose Equivalence** – The DE values of the products of the present invention are higher than those of the Fibersol and NUTRIOSE products.

- **Residual Dextrose** – Here, the residual dextrose is an order of magnitude greater by percentage than that of the prior art.
- **Other Properties** – pH and Ash also differ from the prior art.

The 4-hour digestibility is explained, in part, by results of a methylation analysis performed by Dr. Mungara. Table 2 from the Mungara Declaration is reproduced herein below.

TABLE 2

	NUTRIOSE	Fibersol	Sample 1	Sample 3
linked-glc	% Total Area*	% Total Area*	% Total Area*	% Total Area*
t-glc	19.7	21.1	23.9	21.9
2-glc	3.0	3.7	2.7	2.1
3-glc	4.4	4.2	3.7	3.1
4-glc	26.0	28.8	35.0	42.6
6-glc	12.5	13.7	10.1	7.7
3,4-glc	4.4	3.3	2.8	2.9
2,3-glc + 2,4-glc	3.1	3.5	3.2	3.2
4,6-glc	16.0	14.6	12.7	12.2
2,6-glc + 3,6-glc	4.8	3.4	2.3	1.6
2,3,4-glc	1.1	0.5	0.6	0.5
3,4,6-glc	3.2	1.8	1.9	1.1
2,4,6-glc	1.9	1.4	1.1	1.0
2,3,6-glc**	nd	nd	nd	nd
Total Area %	100.1	100.0	100.0	99.9

Note that the product of the present invention includes bonds other than 1,4 and 1,6, thus differentiating the product of the present invention from Yoshida. The NUTRIOSE and Fibersol products contain fewer 1,4 bonds, indicating lower digestibility.

Dr. Mungara also reports the weight average molecular weights of the above products:

TABLE 3

	NUTRIOSE	Fibersol	Sample 1	Sample 3
Mw	4841	3205	3306	3093

It is seen that the number average molecular weight of the two samples evaluated herein was different from the values reported by Fouache et al.

It is thus seen that the product covered by claim 1 was substantially different from products disclosed in the Meyers and Fouache references. Both the prior art and the present invention disclose carbohydrate or carbohydrate-like materials, but aside from this superficial similarity, the subject matter of the present invention is different from that disclosed in the art.

Applicants are aware that the patentability of a product by process claim requires that that product specified in the claim be novel over the cited art. Applicants have so demonstrated by the Declaration of Dr. Mungara. It is respectfully submitted that the Section 102b rejection cannot be maintained in light of the evidence submitted herewith.

Respectfully submitted,

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